

PATENT ABSTRACTS OF JAPAN

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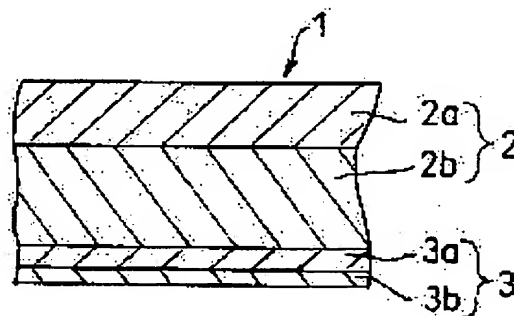
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(54) COVER TAPE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a cover tape wherein a difference between a maximum value and a minimum value of the peeling strength is small at the time of a peeling of the cover tape when being actually installed, and which can be stably peeled, and does not generate a cut of the cover tape.

SOLUTION: This cover tape 1 is bonded to a carrier tape wherein recess sections in which an electronic part is housed are formed, and covers the recess sections. A base material layer 2 comprises an external layer 2a which is a biaxially drawn film layer, and an internal layer 2b of a thermoplastic polyurethane based resin layer. A bonding layer 3 includes an inter-layer peeling layer 3a comprising a thermoplastic polyurethane based resin which is provided on the surface of the internal layer 2b, and an adhesive layer 3b which can be peeled from the inter-layer peeling layer 3a and can be bonded to the carrier tape. The tensile strength of the inter-layer peeling layer 3a is 25 to 50 MPa and is lower than the tensile strength of the internal layer 2b.



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CLAIMS

[Claim(s)]

[Claim 1] In the covering tape which pastes the carrier tape which has the receipt crevice which contains electronic parts, and covers this receipt crevice The base material layer containing a biaxially oriented film layer and a thermoplastic polyurethane system resin layer, The stratum disjunctum which is prepared in the front face of said thermoplastic polyurethane system resin layer, and contains thermoplastic polyurethane system resin, It is the covering tape characterized by being prepared in the front face of said stratum disjunctum, and the tension strength of said stratum disjunctum being lower than the tension strength of said thermoplastic polyurethane system resin layer including the adhesives layer [exfoliate / from this stratum disjunctum / it / and] which can be pasted up on said carrier tape.

[Claim 2] It is the covering tape characterized by the tension strength of said stratum disjunctum being 25MPa-50MPa in a covering tape according to claim 1.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the covering tape for covering the top face of the carrier tape used for receipt and conveyance of detailed components (it only considers as components hereafter) of various electronic parts, a precision machine vessel part article, etc.

[0002]

[Description of the Prior Art] In recent years, the packing material which becomes receipt of semi-conductor components, conveyance, and mounting from a carrier tape and a covering tape is used. This carrier tape is equipped with the crevice doubled with each part shape, and said covering tape is the lid material of this crevice. And after containing components to this crevice, for omission prevention of components and protection, heat sealing or a binder is used and the seal of the covering tape is carried out on a carrier tape. This covering tape exfoliates from a carrier tape at the time of component mounting, and the components taken out from the crevice are attached in a substrate. The mounting rate has accelerated this mounting technology remarkably for the purpose of a productive-efficiency rise every year, and with improvement in the speed of this mounting rate, a covering tape exfoliates from a carrier tape with tension more strong in a short time, and requires a bigger load than before for a covering tape increasingly.

[0003] As for the configuration of the covering tape which is circulating in current and a commercial scene, what consists of an adhesives layer for heat sealing on a base material monolayer and a carrier tape is main. Generally as for the adhesives used for a such heat-sealing type covering tape, polyester system resin, polyurethane system resin, Pori acrylic resin, styrene resin, and ethylene vinyl acetate system resin are used. These adhesives can be pasted up with a carrier tape and moderate bond strength, the contained components are not omitted at the time of conveyance, and exfoliating smoothly from a carrier tape is called for at the time of mounting.

[0004]

[Problem(s) to be Solved by the Invention] However, unlike the bond strength of a packing material with the common peel strength called for in case a covering tape exfoliates, a very low value is required. In order to meet this demand, the technique of checking the adhesive strength of adhesives, for example, the thing which does not have an adhesive property in adhesives, is added conventionally, or applying adhesives partially has been performed. Although it is possible to obtain peel strength predetermined by such technique, the difference (rioting hereafter *****) of the maximum of peel strength and the minimum value may become large at least by jointing. When a carrier tape is a phenomenon which happens since the concave molding section and the non-cast section are located in a line by turns and ***** becomes large to this having jointing continuously, a carrier tape may riot in a conveyance rail at the time of covering tape exfoliation.

[0005] In order that the components contained when ***** of this carrier tape occurred may dance, the poor pickup which components cannot be reversed, or cannot jump out of a crevice, and cannot be mounted by the components takeoff connection, i.e., the pickup section, is produced. moreover -- rioting -- since a carrier tape flusters and moves in a zigzag direction, a "covering tape piece" is generated, and "DERAMI" etc. which a blemish goes into a covering tape and exfoliation between covering tape layers produces within a mounter cassette occurs, and it becomes the poor ejection of components. Each of these becomes the factor which reduces the operating ratio of a mounting machine.

[0006] Furthermore, with improvement in the speed of a mounting rate, with the configuration of a glue line with a mechanical strength weaker than a base material layer, it cannot be coped with by giving priority to a base material monolayer and an adhesive property, the poor ejection of the components by the "covering

tape piece", "DERAMI", etc. occurs the big burden to the covering tape at the time of mounting frequently, and it has become the factor which reduces the operating ratio of a mounting machine.

[0007] It makes it the technical problem to offer the covering tape which does not raise a tape piece while this invention makes small ***** at the time of the exfoliation from a carrier tape, can be stabilized and can exfoliate in view of the above-mentioned problem.

[0008]

[Means for Solving the Problem] This invention solves said technical problem with the following solution means. Namely, paste up invention of claim 1 on the carrier tape which has the receipt crevice which contains electronic parts, and it sets on the covering tape which covers this receipt crevice. The base material layer containing a biaxially oriented film layer and a thermoplastic polyurethane system resin layer, The stratum disjunctum which is prepared in the front face of said thermoplastic polyurethane system resin layer, and contains thermoplastic polyurethane system resin, It is the covering tape which is prepared in the front face of said stratum disjunctum, and is characterized by the tension strength of said stratum disjunctum being lower than the tension strength of said thermoplastic polyurethane system resin layer including the adhesives layer [exfoliate / from this stratum disjunctum / it / and] which can be pasted up on said carrier tape.

[0009] Invention of claim 2 is a covering tape characterized by the tension strength of said stratum disjunctum being 25MPa-50MPa in a covering tape according to claim 1.

[0010]

[Embodiment of the Invention] Hereafter, with reference to a drawing, the operation gestalt of this invention is explained in more detail. Drawing 1 is the sectional view of the covering tape concerning the operation gestalt of this invention, and drawing 2 is the sectional view showing the condition of having pasted up the covering tape concerning the operation gestalt of this invention on the carrier tape. Moreover, drawing 3 is the sectional view showing the condition of having exfoliated the covering tape concerning the operation gestalt of this invention from the carrier tape.

[0011] The covering tape 1 is a member to which the heat seal of the crevice 7 which contains components 6 is carried out to the flange face 9 of the carrier tape 8 continuously formed in the flow direction, and it covers and closes the top face of this crevice 7, as shown in drawing 2. This covering tape 1 is equipped with the base material layer 2 which consists of a bilayer of outer layer 2a and inner layer 2b, and the glue line 3 which consists of interlaminar-peeling layer 3a and adhesives layer 3b as shown in drawing 1. Interlaminar-peeling layer 3a consists of thermoplastic polyurethane system resin whose tensile strength (JISK 7311) is 50 or less MPas, and adhesives layer 3b consists of matrices of the barium-sulfate particle and the thermoplastic acrylic resin with which coating of the conductive tin oxide was carried out. If the covering tape 1 exfoliates from the top-face flange face 9 and a crevice 8 is taken out from components 6 as shown in drawing 3, adhesives layer 3b is designed so that a part may remain in a flange face 9.

[0012] The base material layer 2 is a configuration which consists of outer layer 2a which consists of a biaxial-stretching high polymer film, and inner layer 2b by which the laminating of the much more thermoplastic polyurethane system resin was carried out at least to the glue line side. The thing which comes to apply coat agents, such as a conductive grant agent and a primer, to a biaxially oriented film and the above-mentioned film front faces, such as polyester, a polyamide, and polyolefine, is raised to the biaxially oriented film used for outer layer 2a of a base material. Among these, when thermal resistance, transparency, and rigidity are taken into consideration, the biaxial-stretching polyester film with which biaxial-stretching polyester film or the above-mentioned coat agent was applied is desirable. Since it lacks flexibility when the thickness of outer layer 2a of a base material is 5-50 micrometers, it runs short of rigidity if less than 5 micrometers, and 50 micrometers is exceeded, it is desirable to be especially referred to as 8-20 micrometers.

[0013] What uses 1 liquid type polyurethane, 2 liquid hardening mold polyurethane, or thermoplastic polyurethane as a principal component is raised to the thermoplastic polyurethane system resin used for inner layer 2b of a base material. This polyurethane system resin makes a prepolymer, diisocyanate, and a chain elongation agent react, and is compounded. Polyester, a polyether, poly KABONETO, or these copolymers are used as a prepolymer, and active hydrogen compounds, such as diol and diamine, are used as a chain elongation agent.

[0014] 1 liquid type polyurethane comes to dissolve the thermoplastic polyurethane which shows fusibility in an organic solvent, and is essentially contained in thermoplastic polyurethane. This thermoplastic polyurethane is the macromolecule of the straight chain with which the diisocyanate radical and the active hydrogen functional group were blended ana. (The following texts distinguish and explain 1 liquid type

polyurethane and thermoplastic polyurethane.)

[0015] If thermofusion of the commercial thermoplastic polyurethane is given and carried out by powder or the pellet type, it can be fabricated in the configuration of arbitration, and it is manufactured by obtaining a sheet-like object with extrusion or a calender. The 1 liquid type polyurethane of another side is an ingredient suitable for thermoplastic polyurethane coming to dissolve in organic solvents, such as toluene, dimethyl HORUMUAMAIIDO, and a methyl ethyl ketone, and obtaining a sheet-like object by coating.

[0016] 2 liquid hardening mold urethane is polyurethane of the type which a sex active hydrogen functional group mixes with the blended giant molecule just before fabricating diisocyanate or a chain elongation agent, coincidence is made to harden mostly with shaping, and is obtained. Since this 2 liquid hardening mold urethane is the liquids-and-solutions object of 2 acidity or alkalinity which consists of ** prepolymer, diisocyanate and ** urethane oligomer (the organic solvent solution of the above-mentioned thermoplastic urethane is also contained), a chain elongation agent, etc., it is suitable for obtaining a sheet-like object by coating.

[0017] That to which tensile strength (JIS K 7311) exceeds 50MPa(s) is used, and the thermoplastic polyurethane system resin used for inner layer 2b of the above-mentioned base material has a possibility that it cannot fully respond to the load at the time of mounting at a high speed, but a covering tape piece may be generated, when less than 50MPa. Since heat conduction will cause a poor seal bad if the range of thickness is 5-50 micrometers, it cannot expect the physical properties as a base material if less than 5 micrometers, but it surpasses 50 micrometers, 20-40 micrometers is especially desirable.

[0018] Although there is the extrusion laminating method which carries out the laminating of the polyurethane resin which made the approach of carrying out the laminating of the polyurethane film on a biaxially oriented film, for example, a biaxial-stretching polyethylene-terephthalate film, and was fused to this biaxially oriented film at film-izing and coincidence, or the approach of dissolving in solvents, such as toluene and ethyl acetate, and carrying out the paint film of the polyurethane resin, and carrying out a laminating on this biaxially oriented film in molding of the base material 2 which consists of the above-mentioned outer-layer 2a and inner layer 2b, it is not limited especially in this invention. Moreover, in order to paste up a biaxially oriented film and polyurethane resin firmly, the Anh Kurt agents, such as an isocyanate system, an amine system, and an imine system, may be used, or corona treatment may be performed to this biaxially oriented film.

[0019] The glue line 3 of this invention consists of adhesives layer 3b which consists of mixture of interlaminar-peeling layer 3a which consists of polyurethane resin with tensile strength (JIS K 7311) lower than the thermoplastic polyurethane system resin used for base material inner layer 2b, the barium-sulfate particle by which coating was carried out by conductive tin oxide, and thermoplastic acrylic resin. Moreover, the laminating approach to the base material 2 of interlaminar-peeling layer 3a and adhesives layer 3b can adopt the method of application of the arbitration by the cheap and simple gravure coat, a comma coating machine, etc.

[0020] The thermoplastic polyurethane system resin used for interlaminar-peeling layer 3a What uses 1 liquid type polyurethane, 2 liquid hardening mold polyurethane, or thermoplastic polyurethane as a principal component is raised. Tensile strength (JIS K 7311) is lower than the polyurethane resin of inner layer 2b of a base material. If the thing of 25MPa-50MPa is used and it exceeds 50MPa, ***** of peel strength will become large, generating of the poor pickup by the dance of the contained components 6, a "covering tape piece", etc., etc. will increase, and the operating ratio of a mounting machine will be reduced. If it becomes lower than 25MPa(s), peel strength will become high by the increment in a tuck of polyurethane resin, and poor mounting by the components dance, such as poor pickup and a covering tape piece, will be generated. 0.5 micrometers or less of a seal are insufficient, and the thickness of this interlaminar-peeling layer 3a is clearly superfluous if 15 micrometers is exceeded, and since sufficient seal nature is obtained even if it does not thicken so far, 0.5-10 micrometers is especially desirable [thickness] 0.5-15 micrometers.

[0021] The thermoplastic acrylic resin used for adhesives layer 3b with the barium-sulfate particle by which coating was carried out by conductive tin oxide is usually the thing of the fusibility which uses polymethylmethacrylate, polyethyl methacrylate, poly butyl methacrylate, etc. as a principal component. The combination of the above-mentioned resin, and the introduced functional group and the thing of the various grade from which glass transition temperature changes with molecular weight etc. further, and a thermal property and the matter differ are contained.

[0022] It is carried out to formation of adhesives layer 3b from a barium-sulfate particle by which coating was carried out by thermoplastic acrylic resin and conductive tin oxide by using both mixture as ink and plastering base material inner layer 2b with it. After making solvents, such as toluene and ethyl acetate,

dissolve thermoplastic acrylic resin in this first at 5 - 50% of concentration, the barium-sulfate particle by which coating was carried out by conductive tin oxide into this solution is distributed. The addition of the barium-sulfate particle by which coating was carried out by the conductive tin oxide in this case has the inadequate conductivity of under the 150 weight sections to the thermoplastic acrylic resin 100 weight section, and since it will become weak and flexibility will be lost if the 400 weight sections are exceeded, the 150 - 400 weight section is desirable. Moreover, the thickness of adhesives layer 3b is clearly superfluous if 3 micrometers is exceeded, and since sufficient seal nature is obtained even if it does not thicken so far, it is desirable [thickness / less than 0.3 micrometers of a seal are insufficient, and] to be especially referred to as 0.5-1 micrometer.

[0023] The covering tape 1 concerning the operation gestalt of this invention can prevent the covering tape piece by the load at the time of high-speed mounting by preparing inner layer 2b excellent in tearing resistance and tensile strength inside outer layer 2a of a biaxially oriented film. Moreover, between the layers of the adhesives layer 3b and the base material layer 2 which are heat sealed by the carrier tape 8, it was flexible, comparatively low interlaminar-peeling layer 3a of mechanical strength, such as tensile strength, was prepared, and it pasted up firmly with the base material layer 2 on the occasion of exfoliation, and was made the configuration in which exfoliation advances by interface destruction between adhesives layer 3b and interlaminar-peeling layer 3a. Consequently, little stable peel strength which riots can be obtained. Furthermore, the covering tape 1 with transparency and conductivity can be obtained by using for adhesives layer 3b the thermoplastic acrylic resin which added the conductive filler.

[0024]

[Example] Next, although an example is given and this invention is explained, this invention is not limited to the publication of this example.

[0025]

[Table 1]

	実施例					比較例		
	1	2	3	4	5	1	2	3
外層 使用樹脂 厚み (μm)	PET 16	PET 16	PET 9	PET 16	PET 16	PET 25	PET 16	PET 16
内層 使用樹脂 引張り強さ (MPa) 厚み (μm)	TPU 68 30	TPU 57 30	TPU 57 30	TPU 68 30	TPU 57 30	—	TPU 68 30	TPU 50 30
層間剥離層 使用樹脂 引張り強さ (MPa) 厚み (μm)	TPU 45 5	TPU 30 5	TPU 30 5	TPU 45 2	TPU 30 2	TPU 45 5	—	TPU 50 5
接着材層 厚み (μm)	5	5	5	2	1	5	5	5
高速剥離カバテープ切れ	なし	なし	なし	なし	なし	あり	なし	あり
剥離角度 (°)								
最小値	30	34	41	29	35	32	25	28
最大値	38	43	49	37	44	42	47	45
あばれ (最大値-最小値)	8	9	8	8	9	10	22	17

[0026] PET shown in Table 1 is biaxial-stretching polyethylene terephthalate, and TPU is thermoplastic polyurethane. As shown in Table 1, on the biaxial-stretching polyethylene terephthalate film with which the anchor coat agent was applied to one side, thermoplastic polyurethane was extruded and the film was produced by the laminating method. Next, the ink in which the coat of the conductive tin oxide was carried out and by which barium-sulfate (mean diameter is 0.4 micrometers) 300 weight section mixing distribution was carried out was applied with the gravure coat to the solution of thermoplastic polyurethane system resin, and the polymethylmethacrylate 100 weight section, respectively (laminating), and the covering tape was obtained. About the tensile strength of thermoplastic polyurethane, and thickness, it writes together to Table 1.

[0027] The obtained covering tape was heat sealed on condition that seal width-of-face 0.5mmx2 for the seal pressure of 3kg, the seal temperature C of 170 degrees, and seal time amount 0.4 seconds by using the carrier tape made from polystyrene, and the taping machine VN 3200 (a van guard taping company, product name) for 21.0mm width of face after a slit, both were exfoliated in exfoliation rate 300 mm/min and 50000 mm/min, and the existence of peel strength and a tape piece was measured. This result is shown in Table 1.

[0028] As shown in Table 1, examples 1-5 set the tension strength of interlaminar-peeling layer 3a as 30MPa-45MPa, and make the tension strength of interlaminar-peeling layer 3a smaller than inner layer 2b. In this case, there was all no covering tape piece at the time of high-speed exfoliation, the difference of the maximum of peel strength and the minimum value was 9g or less, and ***** was small. On the other hand, as inner layer 2b shown in drawing 1 was omitted, interlaminar-peeling layer 3a was prepared in outer layer 2a and it was shown in Table 1, the example 1 of a comparison had a covering tape piece at the time of high-speed exfoliation, and was large compared with examples 1-5. [of *****] As interlaminar-peeling layer 3a shown in drawing 1 R> 1 was omitted, adhesives layer 3b was prepared in inner layer 2b and it was shown in Table 1, the example 2 of a comparison becomes [riot and] in ** and was large [a piece] although there was no covering tape piece at the time of high-speed exfoliation. the example 3 of a comparison sets to 50MPa(s) the tension strength of inner layer 2b shown in drawing 1 , and interlaminar-peeling layer 3a, and shows it in Table 1 -- as -- the covering tape piece at the time of high-speed exfoliation -- it is -- also rioting -- it was large.

[0029]

[Effect of the Invention] In the covering tape which pastes the carrier tape which has the receipt crevice which contains electronic parts according to this invention as explained in detail above, and covers this receipt crevice The base material layer containing a biaxially oriented film layer and a thermoplastic polyurethane system resin layer, The stratum disjunctum which is prepared in the front face of a thermoplastic polyurethane system resin layer, and contains thermoplastic polyurethane system resin, It is prepared on the surface of stratum disjunctum, and the adhesives layer which can be pasted up on a carrier tape is included that it can exfoliate from this stratum disjunctum. The tension strength of stratum disjunctum Since it is lower than the tension strength of a thermoplastic polyurethane system resin layer, while ***** at the time of exfoliation of a covering tape becomes small and can stabilize and exfoliate in the case of mounting, a covering tape piece can be prevented.

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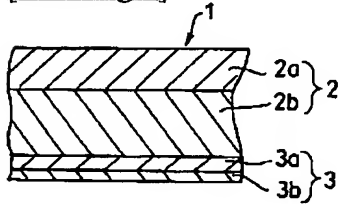
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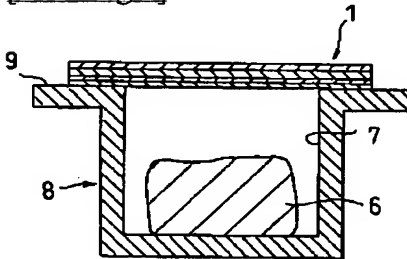
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DRAWINGS

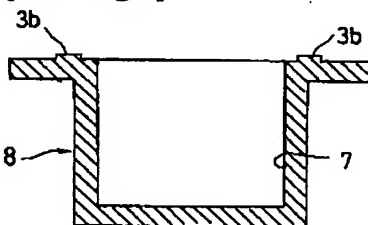
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]